construction in which the gas flows directly from the producer into the underground conduit or gas flue will always possess latent possibilities of an explosion, because the gas in the producer will be at such a low pressure that there will be a negative pressure in the underground flue, with producers working without forced draft.

A gas producer with mains connected in this manner was installed at the Alapayevsky works. The producer was worked without forced draft and the gas main was long. When placed in operation this proved so dangerous that it became necessary to replace the gas main with a metal main forming a Siemens siphon. When this was done there were no more explosions.

4. This method of computing hydrostatic pressure may be applied to the gas mains of a blast furnace producing charcoal iron.

These furnaces have very large bells for charging and the volume of gas is relatively small. The percentage of the gas lost by the bells is considerable and increases rapidly as the pressure of the gas in the mains increases. For this reason it is very important that the mains should be designed to *require the minimum of gas pressure* to overcome the unavoidable resistance to the flow of the gas.

It is also possible to determine the excess of pressure required to overcome the resistance created by poorly designed gas main, too small for the volume of gas flowing, having sharp bends, etc.

Assuming that the height of the furnace is 20 m, the height of a cubic meter of the gas being 1 kg 22 and the temperature in the main 200°, the hydrostatic pressure required at the top of the furnace can be determined. Assuming, on the other hand, that the gas is to be burned under boilers located 3 meters below the hearth level of the blast furnace, the pressure in the gas mains or the burners at the boiler after regulation and control, must not be less than the atmospheric pressure.

The gas mains form an enclosure or chamber 23 meters in height, filled with a' light gas which has the following weight per cubic meter:

1 22

The hydrostatic pressure will be, therefore,

3 = 23 (1 .29 - 0.705) = 13 kg 45 per square meter,